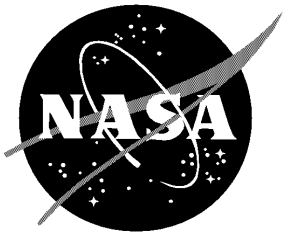

National Aeronautics and Space Administration

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Cooperative Agreement Notice

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NASA Astrobiology Institute
Cycle-3

Expected NOI Due Date: **OctoberXX, 2002**
Expected Proposal Due Date: **DecemberXX, 2002**

OMB Approval No. 2700-0085

Cooperative Agreement Notice

Soliciting Proposals to Become a Lead Team Institutional Member of the NASA Astrobiology Institute (NAI)

Office of Space Science
National Aeronautics and Space Administration
Washington, DC 20546-0001

Table of Contents

1.0 Introduction and Background

This Cooperative Agreement Notice (CAN) solicits proposals for Lead Teams of the NASA Astrobiology Institute for a nominal period of performance of five years, starting in mid-2003. An opportunity for new participation in the NAI exists at this time due to the conclusion, in June of 2003, of the 11 five-year Cooperative Agreements awarded to the Lead Teams which initially comprised the Institute. The original 11 Lead Teams are also eligible to propose and re-compete for an additional term. A Cooperative Agreement implies that a substantial involvement is expected between NASA and the recipient during the performance of the proposed and selected activity. Participation in this solicitation is open to all categories of organizations, domestic and non-U.S., including industry, educational institutions, nonprofit organizations, NASA centers, and other Government agencies. If multisite teaming commitments are established, the proposal should be submitted by the Lead Institution.

Major astrobiology discoveries in the last decade have impacted scientific and public perspectives about the origin and distribution of life. These include dramatic demonstrations establishing the extreme range of environments capable of supporting life, coupled with observations of planets orbiting other stars, evidence of ancient oceans on Mars, and the increasingly widespread acceptance of the likelihood of a present-day ice-covered Europan ocean of liquid water.

In the summer of 1998, NASA and the science community created a Roadmap for Astrobiology that described the scientific goals and objectives for the program. The field of astrobiology has advanced dramatically since that time. In early 2002, therefore, the science community and NASA joined together again to reexamine and revise the original Roadmap to reflect the many discoveries which have been made and the new areas of investigation that have emerged. The Goals of the new Astrobiology Roadmap continue to address the same fundamental questions regarding the origin, distribution, and future of life – providing a general framework for the research supported by the NAI. The Goals, presented below, are not listed in order of priority.

Goal 1 - Understand habitable planets in the Universe. Determine the potential for habitable planets in the Universe, and characterize those that are observable.

Goal 2 - Explore for past or present habitable environments, prebiotic chemistry and signs of life elsewhere in our Solar System. Characterize ancient climates, any extinct life, potential habitats, and any extant life on Mars, and document any chemical precursors of life and potential habitats in the outer Solar System.

Goal 3 - Understand how life emerges from cosmic and planetary precursors. Perform observational, experimental and theoretical investigations to understand the physical and chemical principles underlying the origin of life, both on the Early Earth and on other planetary bodies.

Goal 4 - Understand how past life on Earth interacted with its changing planetary and Solar System environment. Investigate the historical relationship between Earth and its biota by integrating evidence from both the geologic and biomolecular records of ancient life and its environments.

Goal 5 - Understand the mechanisms and environmental limits of microbial evolution. Determine the molecular, genetic, and biochemical mechanisms that control evolution, metabolic diversity, and environmental acclimation of microbial systems.

Goal 6 - Understand the principles that will shape the future of life, both on Earth and beyond. Elucidate the drivers and effects of ecosystem change as a basis for projecting likely future changes on time scales ranging from decades to millions of years, and explore the potential for microbial life to adapt and evolve in environments beyond its planet of origin.

Goal 7 - Determine how to recognize signatures of life on other worlds and on early Earth. Identify biosignatures that can reveal and characterize past or present life in ancient samples from Earth, extraterrestrial samples measured *in situ*, samples returned to Earth, remotely measured planetary atmospheres and surfaces, and other cosmic phenomena.

Complete information on the new Astrobiology Roadmap can be accessed at: http://astrobiology.arc.nasa.gov/roadmap.

The NASA Astrobiology Institute and its Member Investigators work together to achieve the general Goals of the Astrobiology Roadmap by:

- carrying out, supporting, and catalyzing collaborative interdisciplinary research;
- training the next generation of astrobiology researchers;
- providing scientific and technical leadership on astrobiology investigations for current and future space missions;
- exploring new approaches using modern information technology to conduct interdisciplinary and collaborative research amongst widely-distributed investigators; and
- supporting Education and Public Outreach by providing scientific content for K-14 education programs, teaching undergraduate classes, and communicating directly with the public.

NASA's Astrobiology Program is directed by the Office of Space Science and supports awards for technology development, flight missions, individual investigators, and the NASA Astrobiology Institute (NAI). Recognizing that astrobiology encompasses science goals identified with their NASA Enterprises, the Office of Earth Science and the Office of Biological and Physical Research have cooperated with the Office of Space Science in supporting the NAI. The Institute represents a cooperative effort between these three Enterprises and actively seeks to leverage and benefit relevant efforts from other Government agencies, as well as academic and/or research organizations.

In the short time since it was founded, the Institute's Members have made major research contributions to the field of astrobiology. In addition, the degree of institutional commitment provided by both NASA and the Lead Team Institutions has resulted in the development of undergraduate and graduate training programs, the NAI Focus Groups, astrobiology seminar series, and workshops directed at future space missions. The NAI, acting in complement with the activities carried out through individual awards from the NASA Astrobiology Program, has been the leading influence in establishing the discipline of astrobiology.

In addition to their wide distribution in astrobiology-related disciplines, the Lead Team Institutions of the NAI are widely dispersed geographically. The diversity of collaboration represented by the Lead Team consortia is not constrained by the spatial distribution of its participating Members and their Cooperating Institutions. The universities, NASA centers, and other research entities that make up the Institute are tied together by electronic networks, frequent personnel exchanges, mutual participation in field investigations, and ongoing workshops, seminars, and courses, in addition to their sharing of common research interests.

A large volume of reference material is available to provide new proposers with a detailed understanding of NAI research, NASA-supported basic research and technology development, and mission exploration planning. Descriptions of the research of current NAI Members is available at the Institute's web page, http://nai.arc.nasa.gov/institute/lead_teams.cfm. The Cooperative Agreements of the original 11 Lead Teams conclude June 30, 2003. Four additional Lead Teams joined the NAI in July of 2001, through Cooperative Agreements which will continue until June of 2006. These four new Lead Teams are the Jet Propulsion Laboratory 2, Michigan State University, the University of Rhode Island, and the University of Washington. Also available on the Internet are various workshop reports that may provide useful background information (http://astrobiology.arc.nasa.gov).

More information on the strategic issues and research/technology investments of the Office of Space Science programs most directly concerned with astrobiology, namely the Astronomical Search for Origins, Solar System Exploration, and Structure and Evolution of the Universe Science Themes can be found at http://spacescience.nasa.gov/admin/themes.htm. Questions dealing with the adaptability of terrestrial biota to nonterrestrial environments are of major interest to the Office of Biological and Physical Research and are further detailed at http://spaceresearch.nasa.gov. The development and evolution of ecosystems on Earth, and their interaction with rapidly changing biogeophysical and atmospheric environments, is a fundamental theme of the research programs of the Office of Earth Science (http://www.earth.nasa.gov/visions/index.html).

2.0 General Scope and Activities of the Institute

2.1 Definition of Terms

- Institute = NASA Astrobiology Institute (NAI)
- Institution = any research organization
- Principal Investigator (PI) = scientist who is the leader of the research team
- Lead Institution = PI's home institution and the research organization submitting the proposal, either individually or on behalf of a group of cooperating institutions
- Co-institution = any of the group of cooperating institutions other than the lead institution
- Team = the group of scientists from the lead institution and co-institutions who will carry out the proposed research. Each team is identified by the name of the lead institution

- NAI Member = any individual identified by a Lead Team PI as being a member their team
- NAI Associate = non-U.S. astrobiology organization having a formal agreement with the NAI, involving their government and NASA
- NAI Affiliate = non-U.S. astrobiology organization having a formal agreement with the NAI, but not between its government and NASA

2.2 Overview of the Institute

NASA established the NASA Astrobiology Institute, whose Lead Teams were chosen through the first and second NAI Cooperative Agreement Notices (CAN), to promote the most advanced and significant research in astrobiology. The duration of the Institute is expected to be at least 20 years. NASA's contribution to the Institute, in addition to a stable funding stream, is the provision of the Institute Director's office and staff, called NAI Central. The current NAI Director, Dr. Baruch Blumberg, and NAI Central are housed at NASA Ames Research Center, NASA's Lead Center for Astrobiology. NAI Central is responsible for: coordinating Institute activities, advocating the needs and scientific interests of the Members, disbursing funds (including a small Director's Discretionary Fund for high-risk/high-payoff research projects and for fostering collaboration between members), sponsoring the NAI Postdoctoral Fellowship Program, collecting and archiving information on research accomplishments and publications, organizing meetings and workshops, coordinating Institute-wide programs in education and public outreach, and expediting network connectivity while engineering the interfaces between the scientists and the network. NAI Central is also responsible for organizing a General Meeting of all the members of the Institute. Occurring every other year, the NAI General Meeting provides a forum for presenting current research, as well as opportunities for members to initiate and develop new projects.

A single Principal Investigator heads each NAI Lead Team. The Lead Team, through the activities of its Members, will: actively pursue its research program; participate in Institute activities such as workshops, seminars, Focus Groups, classes, training, and education and public outreach; contribute to NASA Science Working Groups and Advisory Committees; and work continuously to improve the effectiveness of the inter-Member connections and collaborations. The NAI Executive Council, consisting of the PI's, meets by videocon on a monthly basis and in person three or four times annually. The Executive Council is the primary technical guiding body of the Institute. In addition, Dr. Blumberg has established the NAI Director's Science Council (Appendix A), a group of distinguished scientists which assists him in reviewing the progress of astrobiology and in identifying and advocating new research directions for the discipline.

2.3 International Partners

The NASA Astrobiology Institute has initiated a program of partnerships with international astrobiology organizations to provide collaborative opportunities for its researchers with the international science community. Through a program separate from this CAN, non-U.S. astrobiology organizations can propose to become either Associate or Affiliate Members of

the NAI based upon the nature of the agreement. Associate Membership entails a formal agreement between NASA and a complementary agency of the non-U.S. Government. Non-U.S. organizations that establish a formal agreement with the NAI which does not involve an agreement between NASA and an agency of the non-U.S. Government are considered Affiliate Members. The current international partners of the NAI, and information on establishing either Associate or Affiliate Membership with the NAI, can be obtained at http://nai.arc.nasa.gov/institute/intl_partners.cfm. Non-U.S. entities interested in this CAN may want, as an alternative, to consider NAI Associate or Affiliate status.

International institutions interested in proposing to this CAN are directed to section 7.2 for detailed guidelines on submission and implementation.

2.4 NAI Focus Groups

One of the major programs initiated by the Institute to develop interdisciplinary collaboration has been the creation of the NAI Focus Groups. Focus Groups are cross-team research or planning efforts formed around a specific topic judged to be of particular significance for advancing the field of astrobiology. There are currently seven active NAI Focus Groups: Mars, EcoGenomics, Mission to Early Earth, EvoGenomics, Europa, Astromaterials, and Titan. More information on the NAI Focus Groups may be found at http://nai.arc.nasa.gov/institute/focus_groups.cfm. Focus Groups include both participants who are Members of the NAI, as well as those drawn from the wider astrobiology community, nationally and internationally.

The duration of each Focus Group is three years, with renewal for additional terms possible. The terms of the Focus Groups are not related to the schedule of Cooperative Agreement Notices, and those which have not reached their three-year limit are to continue beyond the conclusion of the Institute's initial Cooperative Agreements.

2.5 NAI/NRC Postdoctoral Fellowship Program

The NAI established, in the year 2000, an Institute-wide Postdoctoral Fellowship Program under the auspices of the National Research Council. Twelve Fellows are currently on tenure at NAI institutions. Funding for successful candidates is independent of the host institution. Fellows are encouraged to become familiar with the research being conducted within the NAI but beyond their host institution. More information about the NAI's Postdoctoral Program is available at
http://www4.nationalacademies.org/pga/rap.nsf/frmLabInfoSearchResults?ReadForm&44.15~NAI.

2.6 Electronic Communication and Collaboration

The Institute utilizes modern communication and information technology to link Lead and Co-institutions and research Teams in geographically separate locales to enable an effective degree of interaction that supports the conduct of both individual and community-directed research goals. The intention is to facilitate interaction both within and across teams. The creation of an effective organizational culture and the development of NAI's technology

architecture are both improved by Member input solicited on a regular basis by NAI Central. A comprehensive assessment of the current communication and collaboration needs of NAI members was completed in February 2002, which led to recommendations for the deployment of new tools and technologies.

Lead Institution sites are equipped with NASA deployed videoconferencing systems that enable Lead Team Principal Investigators to attend monthly Executive Council meetings, and to confer with one another, with NAI management, and with NASA HQ personnel. These conferencing systems are also utilized for a variety of other purposes by NAI Members located at the Lead Institutions, including joint presentations of classes, seminars, and scientific exchange. Efforts are currently underway to provide desktop communication, collaboration, and knowledge management tools to all NAI Members. This will enable a greater degree of Team cohesion as well as more opportunities for interaction across Teams.

Two Institute-wide seminar series have been established. These are both webcast and broadcast "live" to the Lead Institutions. They are also archived for later viewing and for use as teaching tools by Members. The monthly Director's Seminar Series features a presentation by a Member of one of the NAI Lead Teams. The Astrobiology Research Forum also occurs monthly and provides an opportunity for graduate students and postdoctoral fellows to meet "virtually" across Institutions for presentations and discussion.

2.7 Education and Public Outreach (E/PO)

NAI is committed to fostering the broad involvement of the science community in Education and Public Outreach (E/PO) with the goal of enhancing the nation's formal education system and contributing to the general public understanding of science, mathematics, and technology. NAI conducts E/PO in a two-pronged effort with the Teams directing targeted local and regional outreach programs while the E/PO program at NAI Central coordinates collaborative efforts across the Teams, with NASA funded missions, and undertakes more nationally-oriented activities. Current efforts include workshops and curricula for K-14 students and teachers, museum exhibits and educational workshops, science review of curricular materials, public presentations, conferences, lectures, and community-targeted activities in underserved communities.
Each Team has an identified E/PO Lead and the Leads meet at regular video and teleconferences, the NAI General Meeting, and other educational and scientific meetings, as necessary. Collaboration within the Teams on projects that benefit larger audiences, leveraging of funds from multiple sources, and partnered activities are strongly encouraged. The E/PO Leads are responsible for entering their Team's E/PO activities into the NAI Central databases for inclusion in the NAI Annual Report as well as providing information for the OSS Annual E/PO Report. Information regarding existing NAI E/PO programs and projects may be found in the *NAI Annual Report* at:
http://nai.arc.nasa.gov/library/downloads/NAI_Report_Yr3.pdf.

3.0 Nature of Proposals

3.1 General Scope

Proposals should clearly articulate the innovative interdisciplinary research program to be pursued and the nature of the institutional commitment offered. The emphasis should be on team projects of a multidisciplinary nature. These are to be, for the most part, complementary to research efforts carried out under individual PI grants from NASA, as well as other funding agencies and organizations. Proposals must thoughtfully address their approach to science management within the Lead Team and how the proposed Team and its individual projects are to be integrated into a productive whole. The involvement of researchers from more than one institution may be required to provide the full range of expertise and/or facilities essential to the proposed program.

The term 'Institutional commitment' is intended to include those aspects of the existing or proposed infrastructure that will contribute in a substantial way to the development of the field of astrobiology and the NAI. Examples include: training of undergraduate, graduate, and postgraduate students in astrobiology and its related fields; academic degree or certification programs in astrobiology; departments of and centers for astrobiology; permanent or tenure-track positions; offices, laboratories, and other experimental or computational facilities; communications technology equipment and/or staff time; associated research groups that can be shown to be of direct and substantive benefit to the Institute and the scientific community; and engineering and technology planning and development capabilities that allow substantive contributions to existing or planned NASA missions with direct relevance to astrobiology. In general, the cooperative offer of these and other critical resources to be provided at no cost to NASA's Astrobiology Program by the proposer is considered prima facie evidence of Institutional commitment.

Proposals submitted in response to this CAN (see Appendix B) will be evaluated based on the criteria given in Section 4.0. See Section 5.0 for the available funding.

3.2 Specific Objectives

Successful proposals for Lead Teams of the NASA Astrobiology Institute will include investigations of the highest quality that encompass one or more aspects of astrobiology's broad charter, as presented by the Astrobiology Roadmap. These collaborative research proposals must demonstrate an understanding of, and plan for, science management in large research teams. Of high priority are proposals articulating uniquely astrobiological objectives that would otherwise be nominally outside of the scope of other funding opportunities. Research efforts utilizing the environment of space or orbiting research platforms for experimental biological studies or to address questions in the Earth Sciences are within the scope of this solicitation provided they address the goals and objectives of astrobiology as presented in Section 1.0.

3.3 Desirability for Teaming with Underrepresented and Minority Institutions

NASA agency-wide recognizes that critical steps must be taken to broaden the participation of underrepresented groups and Minority Institutions in NASA research programs and missions. According to *NASA's 1996 Science Policy Guide*, "The economic vitality of our nation depends increasingly on new scientific knowledge and its application. For NASA, this means ensuring that the ideas and capabilities of the widest possible talent pool are brought

to bear on its missions." Further, to ensure that there are enough scientists, engineers, and technologists available to meet the needs of the twenty-first century, the Office of Space Science, "promotes the involvement of underserved/underutilized groups in Space Science education and outreach programs and their participation in Space Science research and development activities," (*Space Science Enterprise Strategic Plan, 2000).*

The NAI itself is committed to increasing the participation of underrepresented groups in its activities through the development of its Minority Institution Program. As a part of this program, the NAI currently has in place a Minority Institution Faculty Sabbatical research opportunity with several of the NAI Lead Teams. This CAN strongly encourages Minority Institutions to propose as Lead Teams or to initiate a dialogue with other institutions that can result in productive research collaborations and possible inclusion as a partner by a proposing Lead Team.

NASA's Office of Equal Opportunity Programs recognizes the definition of a Minority Institution as identified by the Office of Civil Rights, U.S. Department of Education. Additional information regarding the criteria for designation as a Minority Institution and the current list of qualifying institutions can be found at: http://www.ed.gov/offices/OCR/minorityinst.html.

3.4 Electronic Communication and Collaboration

Proposers are reminded that NAI members are expected to engage as active participants in a culture of collaboration. Such a culture rests on the willingness of participants to learn from one another, pursue common goals and objectives, share resources, promote the exchange of students and scientists, and explore communication and collaboration tools that facilitate knowledge building and knowledge sharing.

Thus, proposers are encouraged to include plans utilizing information technology (IT) to promote cohesion both **within** their Lead Team as well as to consider opportunities for interaction **across** Lead Teams. It is important to plan, and if necessary budget for, adequate IT staff, both to support Lead Team Members as they incorporate new communication and collaboration tools in their work, and also to provide a representative member to the NAI IT Working Group. This group is a virtual team composed of IT representatives from each Lead Team working closely with the NAI Collaborative Research Support Group located at Ames.

3.5 Education and Public Outreach (E/PO)

NAI expects education and public outreach to be a significant part of each Lead Team's efforts, and strongly encourages astrobiology researchers to engage actively in education and public outreach as an important component of their NASA-supported professional activities. As a part of the Office of Space Science (OSS) community, NAI participates in OSS's comprehensive approach for making education at all levels (with a particular emphasis on K-14 education) and the enhancement of public understanding of astrobiology integral parts of all of its missions and research programs. The OSS particularly encourages collaborative E/PO efforts with Minority Institutions as a way to introduce this community to the available research opportunities. The two key documents that establish the basic policies and guide all

OSS education and outreach activities are *Partners in Education: A Strategy for Integrating Education and Public Outreach Into NASA's Space Science Programs* (March 1995), and *Implementing the Office of Space Science (OSS) Education/Public Outreach Strategy* (1996). Both documents are available online at: <http://spacescience.nasa.gov/education/resources/strategy/index.htm>, or from Dr. Jeffrey Rosendhal, Office of Space Science, Code S, NASA Headquarters, Washington, DC 20546-0001, USA. Additional information on the current OSS E/PO Program is contained in the Year 2001 OSS E/PO Annual Report which is available online at: http://ossim.hq.nasa.gov/ossepo/.

Building upon these established OSS policies, Education and Public Outreach (E/PO) must be an integral element of all NAI proposals, and up to 5% of the total proposed budget available for this solicitation will be allocated to E/PO activities. Therefore, NASA-funded participants through this CAN are required to become actively involved in planning and implementing an E/PO program and to participate in the national program coordinated by NAI Central. Connections to other ongoing OSS E/PO efforts are also strongly encouraged.

4.0 Proposal Evaluation Criteria and Selection Procedures

The three criteria for evaluation of proposals in response to this CAN are listed below in descending order of importance. Each proposal will be given a composite score based on the following criteria, weighted as indicated in parentheses.

- **Science and Technical Merit of the Research Plan: maximum 60 pages (50%)**
  Scientific and technical merit of the proposed interdisciplinary research program, including innovative and novel approaches to fulfill the research directions, and the likelihood that substantial progress can be made during the proposed duration of the effort. This criterion includes: scientific breadth of the proposed research, plans for coordination of the various science disciplines proposed to accomplish the research, quality of scientific staff, and management approach for multidisciplinary and multiinstitutional team efforts. Also included in this criterion is an evaluation of the proposed cost; that it is reasonable and realistic for the planned research and that there is a high likelihood of completing the investigation within the proposed budget. (See Appendix B, Section B.4.3)
- **Commitment to Strengthening the Astrobiology Community: maximum 20 pages (25%)**
  Merit of the proposal in terms of those components, in addition to the proposed research, that will advance the overall field of astrobiology, including training and E/PO. These should be presented under the following categories, where it is understood that no proposal must necessarily show strength in all of these areas. The plan must include a section on E/PO, and successful proposals are also expected to include some combination of the other elements as appropriate to describe their areas of strength. (See Appendix B, Section B.4.3)

  Education and Public Outreach (up to five pages):

- an active and innovative Education and Public Outreach program in astrobiology directed toward K-14 education programs; science museums or other types of institutions devoted to educating audiences about science, mathematics, and technology; targeted underserved communities including urban, rural, and minority communities; and/or the general public. As indicated by the E/PO evaluation criteria (see below), partnered activities with the professional education community and those leveraging non-NASA funds are especially encouraged. Only the category of E/PO is required under this criterion, which may be up to five pages of the 20-page limit. Costs associated with the E/PO effort are to be explained within the narrative of the E/PO plan and incorporated into the overall *Budget Summary* of the proposal (see Section B.4.3). The specific evaluation criteria that will be used to evaluate the E/PO component of each proposal, together with specific guidelines for preparing an E/PO plan, can be found at:
  http://ssibroker.colorado.edu/Broker/Eval_criteria/Guide/Default.htm.

Other Elements:

- **Professional Community**: staffing or activities that strengthen and support the development of the profession of astrobiology, such as publications programs, workshops, seminar series, focus groups.

- **Training:** development of undergraduate and/or graduate courses, degree programs, or other formalized curricula which results in a certificate, minor, or concentration related to astrobiology.

- **Teaming with Minority Institutions**: efforts to include underrepresented groups in a broad cross-section of team activities; including research, training, E/PO, and other collaborative activities.

- **Staff**: institutional commitment in the form of faculty or staff time dedicated to the discipline of astrobiology, including any personnel for support of E/PO and IT.

- **Facilities**: major laboratory or other facilities for astrobiology research, especially facilities that can be made available to researchers from other institutions.

- **Flight Missions**: participation of team members in the planning or execution of NASA flight missions, including relevant engineering/technology expertise or facilities.

- **Information Technology:** creative and innovative ways to use modern communication technologies to enable research, training, collaboration, and other interactions among NAI members.

- **Linkage to Other Agencies**: existing or planned support for astrobiology-related research and training received from other Government agencies or private foundations.

- **Other**: additional evidence of commitment to building a strong astrobiology community and enhancing the effectiveness of the NAI.

- **Relevance to NASA's Program in Astrobiology: (25%)**
  Relevance to NASA's overall program in astrobiology (as described in the Astrobiology Roadmap) and responsiveness to this specific CAN. This does not represent a separate section of the proposal, but rather is a crosscutting criterion that applies to the proposed research, the educational activities, and the commitment to strengthening the astrobiology community.

The Review Panel will be asked to consider the previous research records of the proposing team members to assist them in evaluating the likelihood for success of the proposed research. Similarly, the Review Panel will also be asked to consider each proposal with regard to existing or previously demonstrated commitment to strengthening the astrobiology community. Therefore, as each proposer addresses the criteria above, they are encouraged to highlight previous or existing commitments to the development of the astrobiology community.

5.0 Budget and Duration of Agreements

Proposals may request periods of performance of up to five years. Funding should be proposed on an annual basis, beginning approximately July 2003. NASA expects to select ten to twelve Lead Teams in response to this CAN. The expected total level of funding available to be divided among these new NAI Members for the first full year is $11.0 M; that figure is expected to increase with inflation for the remaining years of the awards. Note that all budget figures are subject to change as a result of the annual Federal budget process.

NASA may choose to select all or part of a successful proposal. In the event that one or more of the proposals received in response to this solicitation is deemed meritorious of funding, but in need of greater definition, NASA reserves the right to provide interim funding for NAI involvement while the proposal undergoes further development, with the understanding that a revised proposal will be submitted for independent peer review at a time to be determined in the negotiation for the Cooperative Agreement. An additional CAN is expected to be issued in FY 2006 as the Cooperative Agreements with the Lead Team Institutions selected in 2001 expire.

6.0 Proposed Costs and Resource Arrangements

6.1 Special Conditions

If a proposal offers NASA-provided services, including involvement of NASA personnel as team members, the proposed budget must include the full cost of Civil Service labor and NASA Center infrastructure support. If NASA guidance for full cost accounting has not been fully developed by the closing date for proposal submission, NASA Centers must submit cost proposals based on the instructions in the NASA Financial Management Manual, Section 9091-5, "Cost Principles for Reimbursable Agreements," or based on their own, Center-approved, full-cost accounting models. Other Federal Government elements of proposals

must follow their agency's cost accounting standards for full cost. If no standards are in effect, the proposers must then follow the Managerial Cost Accounting Standards for the Federal Government as recommended by the Federal Accounting Standards Advisory Board.

Note that partnering, in which NASA scientists and scientists from other Federal laboratories are involved, can take a number of forms both formal and informal. Any and all valid mechanisms are open for consideration. Examples include: Intergovernmental Personnel Act (IPA) appointments, leaves of absence or sabbaticals to participate on site at any of the institutions, Memoranda of Understanding (MOU's) for shared facility usage, arrangements for joint appointments, and opportunities for Government scientists to teach at accredited universities.

Any equipment costs, purchase, and/or usage costs for specific hardware or software, or any costs associated with the use of high performance networks essential for the proposed research, must be included in the budget. Costs associated with connecting a selected institution to an existing high performance network need not be included. These costs will be negotiated in establishing the individual Cooperative Agreements.

NASA will cover all costs associated with the purchase, installation, and maintenance of Polycom videoconferencing equipment for a designated conference room at the lead institutional site. Additionally, NASA will cover costs associated with certain desktop communication and collaboration tools provided to team PI's and Co-I's.

6.2 Administration of Funding

Ames Research Center will negotiate Cooperative Agreements with successful proposing institutions and will administer all funding. Except as provided below, Cooperative Agreements in accordance with regulations 14 CFR Part 1260 for educational and nonprofit institutions, and 14 CFR part 1274 for commercial organizations will be used as funding instruments for the NASA Astrobiology Institute (*see Grant and Cooperative Agreement Handbook*, NPG 5800.1, available at http://ec.msfc.nasa.gov/hq/grcover.htm).

Specific resource arrangements established under this notice may vary depending on the nature of the Principal Investigator's home organization. Resource arrangements fall into the categories cited below.

Institutions of Higher Education, Nonprofit Organizations, and State and Local Government
For universities, nonprofit organizations, and state and local governments, Cooperative Agreements will be negotiated.

For-Profit Organizations In the case of for-profit organizations, Cooperative Agreements will be negotiated with cost-sharing requirements. The total NASA contribution to the Cooperative Agreement will not exceed 50% of the total project value. Note that profits or fees may be allowable or payable under Cooperative Agreements on a case-by-case basis. To the extent that a for-profit organization teams with an institution of higher education, nonprofit organization, or state or local government, the for-profit organization is expected to provide at least 50% of the costs of its own participation.

National Laboratories For successful proposers from National Laboratories (not including Civil Service or military staff laboratories, but only Government-owned, contractor-operated laboratories), necessary resources will be provided via an interagency funds transfer and documented under a Memorandum of Agreement between the sponsoring organization and NASA.

Other Agency Laboratories Non-NASA Government owned-Government operated laboratory personnel may propose in response to this CAN. For such participants, necessary resources will be provided via an interagency funds transfer and will be documented using a memorandum of agreement between the other agency laboratory and NASA. Negotiated project resources may be used to cover direct project costs.

NASA Centers

(a) NASA personnel may be part of a proposing team. The portion of NASA involvement will be delineated in the negotiated Cooperative Agreement as part of NASA's responsibilities. The costs of NASA participation will be funded using NASA's internal funding procedures and not identified as a cost under the Cooperative Agreement. However, as stated above, the cost associated with NASA participation, using currently specified requirements for full cost accounting, must be included in the total cost of the proposal for evaluation purposes.

(b) NASA-led proposals may be submitted in response to this solicitation. For successful proposers within NASA, the necessary resources will be provided via NASA's internal funding procedures. If researchers from other institutions are included on a successful NASA-led proposal, then the necessary resources will be provided through the funding mechanisms given above, as appropriate.

Non-U.S. Institutions Proposal funding limitations for non-U.S. institutions are discussed in Section 7.2.

7.0 Proposal Submission Information

NASA desires to receive Notices of Intent to propose to aid in establishing a peer review panel that is free from conflict of interest and containing the appropriate expertise. Notices of Intent are to be submitted electronically in accordance with the details in Appendix B, Section B.2. Notices of Intent will be treated as competition-sensitive material; however, they are in no way binding on the individuals or the institutions.

7.1 Information on this Opportunity

Detailed information for preparing a proposal in response to this CAN is included in Appendix B, including instructions to the proposers and sample forms and certifications required for proposal submission. The CAN is available through the OSS home page at: http://research.hq.nasa.gov/code_s/open.cfm.

Identifier:	CAN 02-OSS-XX
Submit Notice of Intent (NOI) & proposal front page to:	http://proposals.hq.nasa.gov
Submit Proposal to:	NASA Astrobiology Institute CAN Office of Space Science NASA Peer Review Services 500 E Street, SW, Suite 200 Washington, DC 20024 Telephone: (202) 479-9030

Note that all investigators proposing to this CAN must, in order to be able to submit an NOI or a proposal electronically, be preregistered in the SYSEYFUS database and receive a User ID and password. This includes the PI, as well as all collaborating Co-I's. SYSEYFUS is an electronic system used by NASA Headquarters to manage research solicitation activity, plan for the receipt of research proposals, track the receipt and peer evaluation of these proposals, and manage funded research. To register visit http://proposals.hq.nasa.gov/proposal.cfm. Early registration is advised. A Help Desk is available via E-mail at proposals@hq.nasa.gov.

Notices of Intent Due:	October 2002 (to be reviewed)
Proposal Due Date:	December 2002 (to be reviewed)
Number of Copies Required:	20 (including signed original)
Selecting Official	Associate Administrator for Space Science
Selections Announced:	After March 2003

Questions or comments specifically about this solicitation should be addressed to:

Dr. Rosalind Grymes
Associate Director
NASA Astrobiology Institute
Mail Stop 240-1
Ames Research Center
National Aeronautics and Space Administration
Moffett Field, CA 94035-1000

Phone: (650) 604-3239
FAX: (650) 604-4251

and sent via E-mail to: CAN3@mail.arc.nasa.gov.

Additional programmatic information about the NASA Astrobiology Program may be obtained from:

Dr. Michael Meyer
Solar System Exploration Division
Code SE
Office of Space Science
NASA Headquarters
Washington, DC 20546

Phone: (202) 358-0307
Fax: (202) 358-3097
E-mail: mmeyer@hq.nasa.gov

Where appropriate, questions and answers will be made publicly available on the NAI web site, at http://nai.arc.nasa.gov.

7.2 Guidelines for Non-U.S. Participation

Additional Guidelines Applicable to Non-U.S. Proposals and Proposals Including Non-U.S. Participation

(1) NASA will consider proposals from outside the U.S. However, non-U.S. entities are generally not eligible for funding from NASA. Therefore, unless otherwise noted, proposals from non-U.S. entities should not include a cost plan unless the proposal involves collaboration with a U.S. institution, in which case a cost plan for only the participation of the U.S. entity must be included. Proposals from non-U.S. entities and proposals from U.S. entities that include non-U.S. participation must be endorsed by the respective government agency or funding/sponsoring institution in the country from which the non-U.S. entity is proposing. Such endorsement should indicate that the proposal merits careful consideration by NASA and, if the proposal is selected, sufficient funds will be made available to undertake the activity as proposed.

(2) All non-U.S. proposals must be typewritten in English and comply with all other submission requirements stated in this CAN. All non-U.S. proposals will undergo the same evaluation and selection process as those originating in the U.S. All proposals must be received before the established closing date. Those received after the closing date will be treated in accordance with Appendix B Section B.1.1 of this provision. Non-U.S. sponsors may, in exceptional situations, forward a proposal without endorsement if the endorsement is not possible before the announced closing date. In such cases, the NASA sponsoring office should be advised when a decision on endorsement can be expected.

(3) Successful and unsuccessful non-U.S. entities will be contacted directly by the NASA sponsoring office. Copies of these letters will be sent to the non-U.S. sponsor. Should a non-U.S. proposal or a U.S. proposal with non-U.S. participation be selected, NASA's Office of External Relations will arrange with the non-U.S. sponsor for the proposed participation on a no-exchange-of-funds basis, in which NASA and the non-U.S. sponsor will each bear the cost of discharging their respective responsibilities.

(4) Depending on the nature and extent of the proposed cooperation, these arrangements may entail:

(i) for less significant exchanges, a Letter of Agreement (LOA) between NASA and the non-U.S. sponsor; or

(ii) for major contributions, a formal Agency-to-Agency Memorandum of Understanding (MOU)

For some major exchanges that will eventually be covered by an MOU or implementing agreement, it may be necessary to establish a study phase LOA that will remain in force until later entry into force of the MOU or implementing agreement. A common example of the latter situation would be a study phase award that entails only a minor U.S. Government financial commitment but requires the legal and/or export control framework provided by a formal international agreement.

For those cooperative contributions that will entail execution of an LOA (in lieu of an MOU) for either reason, the sponsoring non-U.S. entity's letter of endorsement to support (if selected) the proposed non-U.S. contribution must contain either: 1) a clear statement that the sponsoring non-U.S. entity is legally empowered to bind its own national government, or

2) advance agreement that any LOA's required will be governed by U.S. law.

Export Control Guidelines Applicable to Non-U.S. Proposals and Proposals Including Non-U.S. Participation

(1) Non-U.S. proposals and proposals including non-U.S. participation must include asection discussing compliance with U.S. export laws and regulations, e.g., 22 CFR Parts 120-130 and 15 CFR Parts 730-774, as applicable to the circumstances surrounding the particular non-U.S. participation. The discussion must describe in detail the proposed non-U.S. participation and is to include, but not be limited to, whether or not the non-U.S. participation may require the prospective proposer to obtain the prior approval of the Department of State or the Department of Commerce via a technical assistance agreement or an export license, or whether a license exemption/exception may apply. If prior approvals via licenses are necessary, discuss whether the license has been applied for or, if not, the projected timing of the application and any implications for the schedule. Information regarding U.S. export regulations is available at http://www.pmdtc.org and http://www.bxa.doc.gov. Proposers are advised that under U.S. law and regulations, spacecraft and their specifically designed, modified, or configured systems, components, and parts are generally considered "Defense Articles" on the United States Munitions List and subject to the provisions of the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120-130.

NAI Associate and Affiliate Membership

The NASA Astrobiology Institute has initiated a program of partnership with other international astrobiology organizations to provide collaborative opportunities for its researchers with the global science community. This program provides another mechanism,

independent from this CAN, for international researchers to participate in the NAI. See Section 2.3 of this CAN for further information about these opportunities.

8.0 Conclusion

The NASA Astrobiology Institute has, during its initial implementation phase, defined a clear mission for its future, developed a structure that has initiated new multidisciplinary research in astrobiology, and has begun to influence specific space missions. Through this solicitation, NASA expects to add new and innovative research to the existing research strengths of the NAI, while at the same time maintaining the direction and momentum of the Institute. The Lead Teams selected will be asked to contribute to the continuing evolution of the NAI as an effective virtual institute and to the establishment of the broader discipline of astrobiology.

Edward J. Weiler
Associate Administrator
Office of Space Science

Ghassem Asrar
Associate Administrator
Office of Earth Science

Mary E. Kicza
Associate Administrator
Office of Biological and Physical Research

APPENDIX A
NAI Director's Science Council Members

Altman, Sidney
Yale University
Molecular Biology
Nobel/Chemistry '89

Alvarez, Walter
University of California, Berkeley
Earth and Planetary Science

Anderson, Philip W.
Princeton University
Theoretical Physics
Nobel/Physics '77

Brenner, Sydney
Molecular Sciences Institute
Molecular Biology

Chyba, Christopher F.
SETI Institute and
Stanford University

Feigenbaum, Edward
Stanford University
Computer Science
Knowledge Systems Laboratory

Gell-Mann, Murray
Santa Fe Institute
Theoretical Physics
Nobel/Physics '69

Greeley, Ronald
Arizona State University
Geology

Laughlin, Robert B.
Stanford University
Physics
Nobel/Physics '98

Lederberg, Joshua
The Rockefeller University
Genetics
Nobel/Medicine or Physiology '58

Levinthal, Elliott C.
Stanford University
Physics

Lunine, Jonathan I.
The University of Arizona
Planetary Sciences
Chair, Theoretical Astrophysics Program

Purdy, G. Michael
Columbia University
Lamont-Doherty Earth Observatory

Roberts, Richard J.
New England BioLabs
Molecular Biology
Nobel/Medicine or Physiology '93

Sargent, Anneila I.
California Institute of Technology
Astronomy/Astrophysics

Singer, Maxine F.
Carnegie Institution of Washington
Biochemistry

APPENDIX B
SPECIFIC GUIDANCE FOR RESPONDING TO
CAN 02-OSS-01
NASA ASTROBIOLOGY INSTITUTE CYCLE-3

B.1 Introduction

B.1.1 General Provisions and Policies

- Use of Proposals Proposals received in response to a Cooperative Agreement Notice (CAN) will be used only for evaluation purposes. NASA does not allow a proposal, the contents of which are not available without restriction from another source or any unique ideas, submitted in response to a CAN to be used as the basis of a solicitation or in negotiation with other organizations, nor is a preaward synopsis published for individual proposals.

- Public Record A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.

- Nominal Period of Performance for Selected Proposals The period of performance for a proposal submitted in response to this CAN is restricted to five years. Yearly funding allotments are provided only after the submission of an acceptable progress report.

- Unrestricted Freedom to Propose to this CAN NASA OSS welcomes proposals in response to this CAN from all qualified proposers. Participation in this program is open to all categories of U.S. and non-U.S. organizations, including educational institutions, industry, nonprofit institutions, NASA Centers, and other Government agencies. Historically Black Colleges and Universities (HBCU's), other minority educational institutions, and small businesses and organizations owned and controlled by socially and economically disadvantaged individuals or women are particularly encouraged to apply. In accordance with Federal statutes and NASA policy, no eligible applicant shall be excluded from participation in, denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NASA on the grounds of race, color, creed, age, sex, national origin, or disability.

- Opportunity to Propose Education/Public Outreach Activities Education/Public Outreach (E/PO) activities are now considered vital and integral parts of all NASA space science missions and research programs. Therefore, NASA OSS requires proposers to this CAN to submit an E/PO plan as a component to their proposal in accordance with the guidelines given in Appendix B, Section B.4.3.

- Anticipated Level of Competition for Selection Regardless of the budgets that are indicated as available for this program, prospective proposers are advised that NASA programs are traditionally extremely competitive. As a general rule, funding limitations frequently prevent the selection of all of the submitted proposals of high quality.

- Public Access to Data As a matter of NASA policy, all data taken or products created in the performance of a NASA research award are considered to be public domain. In addition, NASA may judge that new data or products (including items produced in the pursuit of Education/Public Outreach efforts) obtained through an investigation selected through this CAN may be of value to the science and/or education communities at large. If so, NASA reserves the right to direct that such items be deposited in an approved publicly accessible site and will negotiate appropriate funding to enable such activities (e.g., the reduction and calibration of the data into a format amenable for use by peer scientists).

- NASA-Provided Data and Computational Infrastructure OSS provides data and computational infrastructure to support its research community. Information on current space science data centers and services can be found at http://ssds.nasa.gov.

- Late proposals Late proposals may be considered only if they are judged to be in the best interest of the Government. Owing to the historically large oversubscription of proposals for NASA's programs, a proposal submitted after the published deadline is unlikely to be considered of uniquely greater value to NASA than the proposals that are submitted on time. Finally, note that processing delays at the proposer's home institution or its method of shipping does not excuse the late submission of a proposal.

B.1.2 Types of Proposing Institutions

NASA OSS accepts proposals in response to its programs from all types of U.S. and non-U.S. institutions (proposals from non-U.S. institutions must adhere to the provisions of Section 7.2 in the main body of this CAN). As an aid to NASA in deciding on the appropriate type of award or agreement in the event that the proposal is selected, one of the categories listed below must be indicated at the appropriate line on the proposal's Cover Page (see Section 4.3 of this Appendix):

- Educational institution -- A university or two- and four-year college (including a U.S. community college) accredited to confer degrees beyond that of the K-14 grade levels (all such institutions are considered by NASA as nonprofit).
- Nonprofit, nonacademic organization -- A private or Government supported research laboratory, university consortium, museum, observatory, or similar organization that supports advanced research but whose principal charter is not the training of students.
- Commercial organization -- An organization of any size that operates for profit (fee basis) and with appropriate capabilities and interests to conduct basic research in science.
- NASA Center -- All NASA Field Centers and the Jet Propulsion Laboratory.
- Other Federal Agency -- Any non-NASA, U.S. Federal Executive agency or Federally Funded Research and Development Center (FFRDC) sponsored by a Federal agency.
- Unaffiliated U.S. resident -- Any person residing in the U.S., whether a U.S. citizen or resident alien, who has the capabilities and access to facilities for carrying out the

proposed project and who, if selected, agrees to fiscal arrangements that, in NASA's opinion, ensures responsible management of appropriated Federal funds.

- Non-U.S. Organizations -- Institutions outside the U.S. that propose on the basis of a policy of no exchange of funds (consult Section 7.2 of this CAN for specific details).

B.1.3 Proposal Personnel

Every organization submitting a proposal in response to this CAN must designate a single Principal Investigator (PI) who will be responsible for the quality and direction of the entire proposed investigation and for the use of all awarded funds. Note that NASA does not accept the designation of a "Co-Principal Investigator;" there must be only one PI who is solely responsible for an investigation.

NASA strongly encourages proposers to identify only the most critically important personnel to aid in the execution of their proposals. Co-Investigators (Co-I's) may be identified who are critical for the successful completion of an investigation through the contribution of unique expertise and/or capabilities, and who serve under the direction of the PI, regardless of whether or not they receive compensation directly under the award. A Co-I must have a well-defined role in the investigation that is explicitly defined in the Management section of the proposal (see Section B.4.3 below). In addition, for all proposals submitted in response to this CAN, evidence of the commitment of all Co-I's to participate in the proposed investigation is required by way of a brief statement even if they are from the same institution as that of the PI (see Section B.4.3 below).

A senior, leading Co-I may be additionally designated as an "Institutional PI" if his/her institution is committed to make a major contribution to a proposal submitted by a PI from another institution. At the recommendation of the NAI Director, NASA may elect to provide an award directly to that Co-I institution with the Institutional PI serving as the "PI" for what otherwise would be a subcontract from the proposing PI institution. However, in such a case, the proposal's designated PI is still held responsible by NASA for the overall scientific direction of the proposed effort.

B.1.4 Proposal Evaluation

The evaluation criteria for this program are given in Section 4.0 of the main body of this CAN. Although NASA makes every effort to secure scientific and technical evaluations from appropriately qualified peers of the proposers, those proposing should provide sufficient detail to enable evaluation by persons who are knowledgeable of, but not necessarily specialists in, the proposed research.

B.1.5 Proposal Selection and Implementation

The selection procedures are given in Section 4.0 in the main body of this CAN. A critical consideration in the selection of proposals for funding will be to maximize scientific return within the available budget. To achieve this objective, NASA will weigh the proposed costs of those proposals deemed meritorious against the available funding; final selection will reflect an appropriate balance.

Each proposer will be notified by postal or electronic mail of their selection or nonselection and offered a debriefing to explain that decision. Note that NASA reserves the right to offer selection of only a portion of a proposed investigation; in such a case, the proposer will be given the opportunity to accept or decline the offer. Those recommended for selection will be informed of the recommended amount of their award and their organization will be contacted by a NASA Procurement Office to arrange for an appropriate funding instrument (for this program, it is expected that a Cooperative Agreement will be sought for all selected institutions other than Government agencies, for which an interagency transfer of funds will be used). In all cases, awards are made to the proposing institution, not directly to the proposal PI. No financial commitment on the part of NASA or the Government may be inferred from any communication, even if in writing, from the NASA Program Scientist, NAI Director, NAI Associate Director, or Selecting Official. Only a NASA Procurement Office can make financial commitments, obligations, or awards on behalf of the Agency and authorize the expenditure of funds.

B.2 Notice of Intent to Propose

In order to plan for a timely and efficient peer review process, Notices of Intent (NOI's) to propose are requested by the date given in Section 7.1 of the main body of this CAN. The submission of an NOI is not a commitment to submit a proposal, nor is information contained therein considered binding on the submitter. NOI's are to be submitted electronically by entering the requested information through the World Wide Web site http://proposals.hq.nasa.gov, which will request the following information:

- the Principal Investigator's name, physical location mailing address, phone number, and E-mail address;
- the name(s) and institution(s) of any Co-Investigator(s) known by the NOI due date;
- a descriptive title of the intended investigation;
- a brief description of the investigation to be proposed; and
- a brief description of the proposed E/PO effort.

A separate NOI must be submitted for each intended proposal. Note that this NOI is also the preliminary version of the Proposal Cover Page/Proposal Summary; and can be used to update your information for the final Proposal Cover Page/Proposal Summary. (see further discussion in Section B.4 below).

B.3 Guidelines for International Participation

Guidelines for proposals involving non-U.S. participation either as the Principal Investigator or as a Co-Investigator must follow the guidelines given in Section 7.2 of the main body of this CAN. Note especially the requirement for the submission of a letter of endorsement from the government agency or funding/sponsoring institution that is sponsoring the non-U.S. participation.

B.4 Guidelines for Preparation of Proposal

B.4.1 Standard Default Formats

The standard, default formats for all proposals submitted in response to this CAN are as follows:

- Typewritten English text using an easily read font having no more than 15 characters per inch on white, 8.5x11 inch paper.
- Single or double column format with at least 1 inch (2.5 cm) margins all around.
- A4 stock may be used for non-U.S. proposals, with appropriately larger top and bottom margins (4 cm) to maintain the U.S. print area.
- Double-sided printing preferred but not required.
- Bound only with metal staples to facilitate recycling (i.e., no cardboard or plastic covers or permanent binders), with the original copy bound in a manner that allows easy disassembly should NASA need to make additional copies.
- No fold out pages, colored illustrations, or photographs unless critical for the unique display of important proposal data.
- No material submitted on any type of electronic media, nor reference to World Wide Web sites for material needed to complete or to review the proposal.
- Use of only metric and standard engineering units.
- Strict adherence to the fixed page limits given in Section B.4.2.

B.4.2 Checklist For Proposal Preparation and Submission

All proposals are to include the following materials in the order and using the titles as given. Details for each item are given in the same order in Section B.4.3.

PRESUBMISSION ACTIVITIES

Notice of Intent (NOI) to Propose - The NOI should be electronically submitted by the date indicated to the World Wide Web site given in Section 7.1 of this CAN.

Note that all investigators proposing to this CAN must, in order to be able to submit an NOI or a proposal electronically, be preregistered in the SYSEYFUS database and receive a User ID and password. This includes the PI, as well as all collaborating Co-I's. SYSEYFUS is an electronic system used by NASA Headquarters to manage research solicitation activity, plan for the receipt of research proposals, track the receipt and peer evaluation of these proposals, and manage funded research. To register, visit

http://proposals.hq.nasa.gov/proposal.cfm. Early registration is advised. A Help Desk is available via E-mail at proposals@hq.nasa.gov.

CONSTITUENT PARTS OF A PROPOSAL

(required and optional, in order of assembly, bound in two separate volumes)

		PAGE LIMITS*
Volume I:		
• Proposal Cover Page/Proposal Summary		Per printout from Web
• Proposal Title Page (optional)		1
• Table of Contents		1
• Executive Summary		3
• Summary of Personnel, Commitments, and Costs		1
• Research and Management Plan		60**
• References		None
• Plan for Strengthening the Astrobiology Community		20***
Volume II:		
• Proposal Cover Page/Proposal Summary (repeat from Volume I)		
• Facilities and Equipment (as appropriate)		5
• Curriculum Vitae	For the PI:	3
	For each Co-I:	1
• Current and Pending Support		None
• Statement(s) of Commitment from Proposing Personnel		None
• Letters of Commitment from Consortium Institutions		None
• Budget Summary and Details		None
• Reprints/Preprints (optional)		None

* where each side of a sheet containing text or illustration counts as a page and each "n-page" fold-out counts as n-pages.

** including illustrations, tables, and figures.

*** including illustrations, tables, and figures; must include a section, of up to five pages, on Education and Public Outreach

SUBMISSION ACTIVITIES

Proposal Cover Page/Proposal Summary - print out final and complete version from specified Web site to secure the Principal Investigator and Authorizing Institution signatures and to produce the required number of hard copies to be submitted (original signed *Proposal Cover Page/Proposal Summary* to preface original of proposal).

Provide for delivery of the specified number of hard copies (20 plus signed original) of the proposal to the designated address by close of the normal business day on the specific Due Date (see Section 7.1 of the CAN).

B.4.3 Details of Proposal Contents

All proposals in response to this OSS CAN should be assembled with the following parts in the order listed (note that some are optional). Proposals that omit any of their required parts will be returned without review.

- *Proposal Cover Page/Proposal Summary*

All proposals must be prefaced by an integrated *Proposal Cover Page/Proposal Summary* that contains the information specified below. This item is produced by first entering the requested information electronically through a World Wide Web site (specified in Section 7.1 of the CAN) and then printing out this form by the proposer. A sample of this Web form may be printed out at any time for preliminary inspection. The only valid format for submission of this item is through the Web. The printed copy of the electronically submitted form (typically three to four pages long) is then used to obtain original signatures of the PI and an official from the proposing institution to submit with the original copy of the proposal. In addition, reproductions of this original *Proposal Cover Page/Proposal Summary* are used to preface the required printed copies of the proposal.

Upon accessing the specified Web site, the following information for the *Proposal Cover Page* will be requested:

1) Name and full institutional mailing address of the proposing Principal Investigator, telephone and facsimile numbers, and E-mail address (Note: an open block for signature and date will be provided on the printed hard copy).
2) The name and title of the Authorizing Official of the proposing institution (Note: an open block for signature and date will be provided on the printed hard copy).
3) Names, institutional affiliations, and E-mail addresses of any Co-Investigators (see definition of Personnel in Section B.1.3; also note that all listed Co-I's must also be functionally identified in the proposal - see Section B.4.3).
4) Abbreviated title of proposed investigation (limited to 50 characters).
5) Full descriptive title of proposed investigation.
6) The proposed start and end dates of the full period of performance.
7) The designation of the appropriate 'theme' of the Office of Space Science (Note, for this CAN select 'Solar System Exploration').
8) A summary of the proposed investigation (< 2500 characters including spaces). The *Summary* provides background and perspective to the interested reader and, therefore, must include the following information:
   a) A description of the key, central objectives of the proposed research activity in terms that a nonspecialist can grasp and a statement of methods proposed to accomplish those proposed objectives;
   b) The perceived significance of the proposed work to NASA OSS interests; and
   c) A brief description of the proposed E/PO program.
9. Designation of the type of institution per the definitions in Section B.1.2 above (a menu is provided).
10. NASA Grant or Contract Number of any current NASA award that the PI may hold that is a logical predecessor of the newly proposed work.

11. The physical mailing address, telephone number, and E-mail address of the office of sponsored research programs at the proposing institution.
12. A Budget Summary for each year of the proposed period of performance, as well as the total effort (see additional information below).

Special conditions and instructions concerning the *Proposal Cover Page/Proposal Summary*:

1) Changes (such as whiteout or additions) to the *Proposal Cover Page/Proposal Summary* as printed from the Web are not permitted. Any needed changes to the electronically submitted information may only be made by editing the electronic submission by following the instructions of the Web page, after which the final *Proposal Cover Page/Proposal Summary* is then printed in order to secure the necessary signatures.

2) The authorizing institutional signature on the *Proposal Cover Page* certifies that the proposing institution has read and is in compliance with the three required certifications printed in full in Section B.5 of this Appendix; therefore, it is not necessary to separately submit these certifications with the proposal.

3) Electronic submission of a *Proposal Cover Page/Proposal Summary* does not satisfy the deadline for proposal submission. The required number of proposal copies (see Section 7.1) must be received at the indicated address by the proposal due date.

4) NASA OSS will publish the name of the proposal, the PI, the proposing institution, and the *Proposal Summary* of every selected investigation in a public data base. Therefore, the Summary should not include proprietary information that precludes its unrestricted release (see further on proprietary information below).

- *Proposal Title Page*

The *Proposal Title Page* is optional, and its design is at the discretion of the proposer. If one is included, at a minimum it must include the full title of the proposal, the name of the Principal Investigator, the name and address of the proposing institution, and a list of any other institutions participating in the proposed investigation. In addition, as required, this page may contain a "Notice of Restriction on Use and Disclosure of Proposal Information" in accordance with the following policy:

It is NASA policy to use information contained in proposals for evaluation purposes only. While this policy does not require that the proposal bear a restrictive notice, offerors or quoters should, in order to maximize protection of trade secrets or other information that is commercial or financial and confidential or privileged, place the following Notice on the Title Page of the proposal and specify the information subject to the Notice by inserting appropriate identification, such as page numbers, in the Notice. In any event, information (data) contained in proposals will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the Notice.

Notice of
Restriction on Use and Disclosure of Proposal Information

The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract (or other agreement) is awarded on the basis of this proposal, the Government shall have the right to use and disclose this information (data) to the extent provided in the contract (or other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.

- *Table of Contents*

A *Table of Contents* shall identify each of the key parts of the proposal, including the subsections of the proposal's central Research and Management section, and Plan for Strengthening the Astrobiology Community. To facilitate developing and assembling the proposal, each of its principal sections may be individually numbered.

- *Executive Summary*

The *Executive Summary* should clearly describe the proposed program: its rationale, innovations, distinguishing features, unifying intellectual focus, proposed research, and training plans; its approach to management of its participating personnel and institutions; and its proposed Education/Public Outreach activities. In addition, this *Summar*y should briefly address the proposed institutional commitment(s) as well as the commitment to implementing the collaborative and networking concepts of the NASA Astrobiology Institute.

- *Summary of Personnel, Commitments, and Costs*

The proposal must contain a one page summary list, in simple tabular form of the proposer's own choosing, that gives the names and intended work commitment for the PI and every Co-I of the proposed investigation both in time (rounded to the nearest 0.01 of a Work Year) and unburdened salary (rounded to the nearest $1K) for each year of the proposed period of performance (Note: "unburdened" means without addition of overhead or fees). These entries of commitments should be shown separately for the research effort and for the E/PO Plan.

- *Research and Management Plan*

The proposal should contain sufficient detail to fully describe the proposed effort in order to enable a reviewer to make informed judgments about the overall merit of the proposed research and about the probability that the investigators will be able to accomplish their stated objectives with the resources requested and with their own resources. In addition, the proposal should indicate clearly the interdisciplinary nature of the research, innovative approaches, and how the individual researchers (and their institutions, if a consortium of institutions is proposed) will be integrated so as to carry out the plan.

This section is the main body of a proposal and should cover the following topics in the order given, all within the specified limit of 60 pages:

- The objectives and expected significance of the proposed research, including a complete description of any instruments or hardware proposed to be built in order to carry out the research (Note: see also the Facilities and Equipment section below for the description of critical equipment needed for carrying out the proposed research).
- How the proposed work is expected to build on and otherwise extend the state of knowledge in the field.
- The technical approach and methodology to be employed in conducting the proposed research, including any special facilities of the proposing institution(s) and/or capabilities of the proposer(s) for carrying out the work.
- The relevance of the proposed work to past, present, and/or future NASA OSS programs and interests or to the specific objectives given in this CAN.
- An outline of the general plan of work, including anticipated key milestones for accomplishments and the management structure for the personnel involved.
- A statement of the expected contribution by the PI and each Co-I identified on the proposal, even if they do not derive support from the proposed budget (Note: Co-I's who have either insignificant or unjustified roles will be considered a weakness for purposes of the evaluation of the proposal).

Each proposal must indicate how the activities of the researchers from different science disciplines will be integrated in implementing the proposed research program, as well as the proposed E/PO effort. This part should define the roles and responsibilities of each participant and note the proportion of each individual's time to be devoted to the proposed research activity. The proposal should state clearly and unambiguously whether these key personnel have reviewed the proposal and endorsed their participation. If multiple institutions are involved in the proposal, this part should provide a specific plan for bringing the separate elements together into a well-functioning unit. If a consortium of institutions is proposed, letters verifying cooperation, coordination, and commitments of resources from administrative officials of the consortium members must be included as an appendix to the proposal.

This section may contain illustrations that amplify and demonstrate key points in the main text of the proposal (including milestone schedules, if appropriate). Any illustrations and figures must be of publication quality, of an easily viewed size, and have self-contained captions that do not contain critical information not provided elsewhere in the proposal.

- *References*

All citations given in the *Research and Management Plan* must be included in full in a list of references.

- *Plan for Strengthening the Astrobiology Community*

Refer to Section 4.0, and the criterion regarding proposed efforts to strengthen the astrobiology community, for a description of what is to be addressed in this section. The proposed effort should be organized according to the categories indicated in section 4.0, and which are presented again below. The plan must include a section on E/PO. Successful proposals are also expected to include some combination of the other elements, as appropriate, to describe their areas of strength.

Education and Public Outreach (up to five pages):

- an active and innovative Education and Public Outreach program in astrobiology directed toward K-14 education programs, museums, targeted underserved communities including urban, rural and minority communities, and/or the general public. Partnered activities and those leveraging non-NASA funds are especially encouraged.

- The E/PO plan should address the Team's specific approach to communicating astrobiology to K-14 students and teachers, museums and informal education programs, including community groups, **and/or** the general public. The plan need not address all audiences but should detail the approach, the audiences, the impacts and/or metrics involved in the projects, and the personnel and their expertise. Costs associated with the E/PO effort are to be explained within the narrative of the E/PO plan and incorporated into the overall *Budget Summary* of the proposal (see section on budget below).

Additional Elements:

- Professional Community: staffing or activities that strengthen and support the development of the profession of astrobiology, such as publications programs, workshops, seminar series, focus groups

- Training: development of undergraduate and/or graduate courses, degree programs, or other formalized curricula which results in a certificate, minor, or concentration related to astrobiology

  Training opportunities for undergraduates, postgraduates, and/or postdoctoral associates should be explained in detail. This part should identify how qualified

individuals will be recruited to this new field of research, and especially how the opportunities for interdisciplinary study and research will be enabled. The proposed selection process should indicate how adequate attention will be paid to the recruitment of women and minorities. This part should also summarize the training of students completed during the last three years under the direction of the proposed senior personnel as evidence of their experience and commitment to this important aspect of the NAI.

- Teaming with Minority Institutions: efforts to include underrepresented groups in team activities, including research, training, E/PO, and other collaborative activities

- Staff: institutional commitment in the form of faculty or staff time dedicated to the discipline of astrobiology, including any personnel for support of E/PO and IT

- Facilities: institutional commitment in the form of major laboratory or other facilities for astrobiology research, especially facilities that can be made available to researchers from other institutions

- Flight Missions: participation of team members in the planning or execution of NASA flight missions, including relevant engineering/technology expertise or facilities

- Information Technology: creative and innovative ways to use modern communication technologies to enable research, training, collaboration, and other interactions among NAI members

- Linkage to Other Agencies: existing or planned support for astrobiology-related research and training received from other Government agencies or private foundations

- Other: additional evidence of commitment to building a strong astrobiology community and enhancing the effectiveness of the NAI

Statements regarding institutional commitment should provide in detail the specific resources that the proposing institution(s) will make available to this effort at reduced and/or no cost to NASA's Astrobiology Program, together with an estimate of the value of those resources to this program. The basis for this estimate should be clearly articulated so that the Government can accurately assess the proposed institutional commitment (see Section 3.1 in the main body of this CAN for examples of institutional commitment). This part should clearly show how these resources will benefit the implementation of the proposed research effort, the proposed training, education and outreach plan, and/or the development of the networked institute concept.

- *Facilities and Equipment*

As appropriate, this section should describe any facilities (including any U.S. Government owned facilities) and/or major equipment critical for carrying out the proposed project that are already available or would need to be purchased in order to carry out the proposed investigation. In the latter case, these costs should be entered in the required proposal *Budget Summary* and described in accompanying budget details.

- *Curriculum Vitae*

The PI must submit a *Curriculum Vitae* (not to exceed three pages) that includes a history of his/her professional training and positions and a bibliography of publications relevant to the proposal. The proposal must also include a one page *Vitae* for each Co-I. A Co-I who serves as an Institutional PI (see section B.1.3 above), or as the lead Co-I for an E/PO effort, may submit a *Vitae* using the same page limit as for the PI.

- *Current and Pending Support*

Information must be provided for all ongoing and pending projects and proposals that involve the proposing PI and any Co-I's who are expected to perform a significant share of the proposed work (e.g., an Institutional PI; see section B.1.3 above), whether or not their contributions are specific costs in the proposal's budget. Information is required for each of two categories of support awards that exist at the time of the proposal submission deadline, namely:

a) Current Support (for any of the period that overlaps with the proposal being submitted to this CAN), and
b) Pending Support (including the proposal to this CAN).

For each of these categories, provide the following information for each such key individual on the proposal team as noted above:

- Title of award or project;
- Program name (if appropriate) and sponsoring agency or institution (including point of contact with telephone number);
- Proposed period of performance and budget; and
- Commitment in fractions of a full time Work Year (WY = 2080 hr).

In addition, provide the name of any other institution, including an individual point of contact with their telephone number, to which the proposal submitted to this CAN, or any part thereof, has been or will be submitted for consideration of funding. For such pending research, the PI must notify the NAI Associate Director immediately of any successful proposals that are awarded anytime after the proposal submission date until the time of selections.

- *Statement(s) of Commitment from Co-I's and/or Collaborators*

Every Co-I and Collaborator, from either a U.S. or from a non-U.S. institution, identified as a participant in the proposal must submit a brief, signed statement of commitment that acknowledges his/her participation even if they are from the PI's own institution. In the case of more than one Co-I and/or Collaborator, a single, multiply-signed statement is acceptable. Each statement should be addressed to the PI and must contain a specific reference to the proposal and the nature of the work being contributed. Facsimiles or E-mails are acceptable.

- *Letters of Commitment from Consortium Institutions*

Each member institution proposing as part of a consortium proposal must provide a letter signed by an appropriate member of its administration that certifies its commitment to its resources offered in the proposal (office space, computer or laboratory facilities, in-kind services, etc.).

- *Budget Summary and Details*

The required *Proposal Cover Page* contains a table for the submission of a *Budget Summary* in accordance with the following format and instructions. A *Budget Summary* is to be submitted for <u>each year</u> of the proposed effort, as well as for the <u>total period</u> of performance. The proposed costs are to be summarized according to the following categories:

- Direct Labor (salaries, wages, and fringe benefits)
- Other Direct Costs:
  - Subcontracts
  - Consultants
  - Equipment
  - Supplies
  - Travel
  - Other
- Facilities and Administrative Costs
- Other Applicable Costs
- Subtotal--Estimated Costs
- Less Proposed Cost Sharing (if any)
- Carryover Funds (if any)
  - Anticipated amount
  - Amount used to reduce budget
- Total Estimated Costs

Instructions for the *Budget Summary* are as follows:

1) Provide a complete Budget Summary for the total as well as each individual year of the proposed period of performance.
2) Provide, as attachments, detailed computations of all estimates in each cost category with narratives as required to fully explain each proposed cost as follows.

- Direct Labor (salaries, wages, and fringe benefits): Attachments should list the number and titles of personnel, amounts of time to be devoted to the grant, and rates of pay.
- Other Direct Costs:
    a. Subcontracts: Attachments should describe the work to be subcontracted, estimated amount, recipient (if known), and the reason for subcontracting.
    b. Consultants: Identify consultants to be used, why they are necessary, the time they will spend on the project, and rates of pay (not to exceed the equivalent of the daily rate for Level IV of the Executive Schedule, exclusive of expenses and indirect costs).
    c. Equipment: List separately. Explain the need for items costing more than $5,000. Describe basis for estimated cost. General purpose equipment is not allowable as a direct cost unless specifically approved by the NASA Grant Officer. Any equipment purchase requested to be made as a direct charge under this award must include the equipment description, how it will be used in the conduct of the basic research proposed and why it cannot be purchased with indirect funds.
    d. Supplies: Provide general categories of needed supplies, the method of acquisition, and the estimated cost.
    e. Travel: Describe the purpose of the proposed travel in relation to the grant and provide the basis of estimate, including information on destination and number of travelers where known.
    f. Other: Enter the total of direct costs not covered by above. Attach an itemized list explaining the need for each item and the basis for the estimate.
- Facilities and Administrative (F&A) Costs: Identify F&A cost rate(s) and base(s) as approved by the cognizant Federal agency, including the effective period of the rate. Provide the name, address, and telephone number of the Federal agency official having cognizance. If unapproved rates are used, explain why, and include the computational basis for the indirect expense pool and corresponding allocation base for each rate.
- Other Applicable Costs: Enter total explaining the need for each item.
- Subtotal-Estimated Costs: Enter the sum of all items listed above.
- Less Proposed Cost Sharing (if any): Enter any amount proposed. If cost sharing is based on specific cost items, identify each item and amount in an attachment.
- Carryover Funds (if any): Enter the dollar amount of any funds expected to be available for carryover from the prior budget period Identify how the funds will be used if they are not used to reduce the budget. NASA officials will decide whether to

use all or part of the anticipated carryover to reduce the budget (not applicable to 2nd-year and subsequent-year budgets submitted for award of a multiple year award).

- Total Estimated Costs: Enter the total after subtracting Proposed Cost Sharing and applied Carryover Funds from the Subtotal Costs. Note that this amount must match the amount presented on the *Proposal Cover Page.*
- Note also the following important considerations when completing the *Budget Summary:*

(i) Costs associated with the E/PO plan are to be incorporated into the overall *Budget Summary* of the proposal. **The total annual cost of the E/PO budget must be identified in the E/PO plan for each year of the proposal.** Sufficient detail should be included in the narrative of the E/PO plan to identify the individual major items associated with the total cost of the E/PO effort for each year. A separate budget for the E/PO plan may be included, following the same format presented above for the *Budget Summary* of the entire proposal.

(ii) If a proposal is selected for award, failure to adequately address the provisions of the Instructions for Equipment will require that NASA contact the proposing institution for the required information. Such activity may delay the award until the purchase is either justified as a direct charge for general-purpose equipment or is budgeted as an indirect expense.

(iii) If a PI from a non-Government institution proposes to team with a Co-I from a U.S. Government institution (for this purpose, JPL is considered a NASA Center), then the institutional budget for that Government Co-I is to be included in the proposal's Budget Details, and the cost for this Government Co-I is to be listed under Other Applicable Costs of the *Budget Summary*. If the proposal is selected, NASA will execute an inter- or intra-Agency funds transfer, as appropriate, to cover the cost of the Government Co-I. Conversely, if a Government PI institution teams with a private sector Co-I institution, that Government institution is expected to cover such Co-I costs through a subcontract that they execute. Therefore, such private sector Co-I costs should be entered under Subcontracts on the *Budget Summary*.

(iv) The proposing (PI) institution must subcontract the funding of all proposal Co-I's who reside at other institutions (except for a Government Co-I for a private sector PI as noted above); that is, NASA will not separately make awards to Co-I's at distributed institutions regardless of the cost impact to the PI proposal for the management of such subcontracts.

(v) In addition to the *Budget Summary*, and in accordance with the Instructions for *Budget Summary* presented above, the proposing institution must append at the end of the proposal sufficient details in narrative format to allow a full understanding of the budget. The proposing institution may also append the proposed budget in the format of their choice and without page limit.

(vi) NASA expects to be operating on the basis of full cost accounting as soon as possible, including all Civil Service

salaries with overhead. In the interim period, proposals involving NASA and JPL employees as either a PI or a Co-I should use the accounting method authorized at their institutions at the time proposals are due and for the entire proposed period of performance.

Reprints/Preprints

Reprints/preprints of peer-reviewed publications that are considered critical to understanding the background of the proposal and that may not be easily available in the published literature may be appended to the proposal. However, even if such items are appended, NASA's peer reviewers are directed to base their judgments of the merits of the proposal only on its Research and Management section and other related parts as described above.

B.5 Required Certifications

These individual Certifications are included for reference only and need not be signed and returned; language is now included on the *Proposal Cover Page* that is printed from the Web that confirms that these certification requirements are met once the *Proposal Cover Page* is signed by the Authorizing Institutional Representative and submitted with the proposal.

B.5.1 Certification Regarding Debarment, Suspension, and Other Responsibility Matters

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, Participant's responsibilities. The regulations were published as Part VII of the May 26, 1988 Federal Register (pages 19160-19211).

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
   (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
   (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statues or commission of embezzlement theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
   (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
   (d) Have not within three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

B.5.2 Certification Regarding Lobbying

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000, and not more than $100,000 for each such failure.

B.5.3 Certification of Compliance with the NASA Regulations Pursuant to Nondiscrimination in Federally Assisted Programs

The *(Institution, corporation, firm, or other organization on whose behalf this assurance is signed, hereinafter called "Applicant ")* hereby agrees that it will comply with Title VI of the Civil Rights Act of 1964 (P.L. 88-352), Title IX of the Education Amendments of 1962 (20 U.S.C. 1680 et seq.), Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and the Age Discrimination Act of 1975 (42 U.S.C. 16101 et seq.), and all requirements imposed by or pursuant to the Regulation of the National Aeronautics and Space Administration (14 CFR Part 1250) (hereinafter called "NASA") issued pursuant to these laws, to the end that in accordance with these laws and regulations, no person in the United States shall, on the basis of race, color, national origin, sex, handicapped condition, or age be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Applicant receives federal financial assistance from NASA; and hereby give assurance that it will immediately take any measure necessary to effectuate this agreement.

If any real property or structure thereon is provided or improved with the aid of federal financial assistance extended to the Applicant by NASA, this assurance shall obligate the Applicant, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which the federal financial assistance is extended or for another purpose involving the provision of similar services or benefits. If any personal property is so provided, this assurance shall obligate the Applicant for the period during which the federal financial assistance is extended to it by NASA.

This assurance is given in consideration of and for the purpose of obtaining any and all federal grants, loans, contracts, property, discounts, or other federal financial assistance extended after the date hereof to the Applicant by NASA, including installment payments after such date on account of applications for federal financial assistance which were approved before such date. The Applicant recognized and agrees that such federal financial assistance will be extended in reliance on the representations and agreements made in this assurance, and that the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Applicant, its successors, transferees, and assignees, and the person or persons whose signatures appear below are authorized to sign on behalf of the Applicant.

NASA Form 1206